

CLAIMS

What is claimed is:

1. In a system including an application having a plurality of components, at least one component having a property, each property being identified with an identifier, a method of associating an element of a user-interface to a current state of a property, the method comprising:
associating the element of the user-interface with a property path, the property path including a concatenation of a plurality of identifiers, the concatenation of identifiers defining a path through the components of the application to a property at the end of the concatenation; and mapping the property path to a current state of the property at the end of the path defined by the concatenation of identifiers, to associate the element of the user-interface with the current state of that property.
2. The method of claim 1 wherein the step of mapping the property path further comprises:
 - a) examining each identifier in the concatenation of the property path in succession;
 - b) determining, for the first identifier in the concatenation of the property path, a second state of a property with a name identical to the first identifier, a component of the application containing that property becoming a root application component;
 - c) identifying, for the first identifier, a component of the application to which the second state points as a current application component;
 - d) mapping the first identifier to the second state;
 - e) determining for the next identifier in the concatenation of the property path, a next state of a property with a name identical to the next identifier located within the current application component;

- 12 f) identifying, for the next identifier, a component of the application to which the next
- 13 state points as a current application component;
- 14 g) mapping the next identifier to the next state; and
- 15 h) repeating steps e, f and g until the last identifier of the concatenation is examined to
- 16 map the property path to the current state of the property with a name identical to the last
- 17 identifier.

1 3. The method of claim 1 wherein the step of mapping the property path to the current state
2 further comprises mapping the property path to an undefined state if no property is found that
3 corresponds to an identifier in the plurality of identifiers in the concatenation.

1 4. The method of claim 1 wherein the step of mapping further comprises generating a node
2 tree having a plurality of nodes, wherein each node of the node tree represents a mapping of an
3 identifier to one of, a state of a property and an undefined state.

4 5. The method of claim 4 wherein the node tree represents a plurality of property paths.

5 6. The method of claim 1 further comprising monitoring a plurality of states within the
6 application to detect a change in one of the states of the plurality of states, each state in the
7 plurality corresponding to one of the states mapped to an identifier in the concatenation of the
8 property path.

1 7. The method of claim 6 wherein the step of monitoring further comprises receiving a
2 property change event from a JAVABEAN-compatible component.

1 8. The method of claim 6 further comprising re-mapping the property path to a new current
2 state in response to detecting the change in one of the states of the plurality of states.

1 9. The method of claim 6 further comprising re-mapping the identifier the concatenation of
2 identifiers to the changed state in response to detecting the change in one of the states of the
3 plurality of states.

1 10. The method of claim 1 further comprising generating a property change message in
2 response to a change in a state of a property corresponding to one of the identifiers in the
3 concatenation of the property path.

1 11. The method of claim 1 further comprising updating one or more user-interface elements
2 associated with the property path with a new current state in response to a change in the current
3 state of the property.

1 12. The method of claim 1 wherein the step of re-mapping the property path further
2 comprises:

- 3 a) detecting a change in one of a plurality of states in an application, each state in the
4 plurality corresponding to one of the states mapped to an identifier in the concatenation of the
5 property path,
6 b) examining each identifier in the concatenation of the property path in succession,
7 starting with an identifier corresponding to the changed one of the states of the plurality of states;
8 c) determining for a currently examined identifier, a new next state of a property with a
9 name identical to the currently examined identifier;
10 d) re-mapping the currently examined identifier to the new next state in response to a
11 change in a currently mapped state; and
12 e) repeating steps c and d for each subsequent identifier in the concatenation of
13 identifiers.

1 13. The method of claim 12 wherein the step of repeating for each subsequent identifier
2 further comprises terminating the repeating in response to the new next state being identical to a
3 state currently mapped for that currently examined identifier.

1 14. The method of claim 12 further comprising monitoring a new plurality of states within
2 the application, the new plurality including the new next states mapped to an identifier in the
3 concatenation of the property path.

1 15. The method of claim 1 wherein the property path is a first property path and the
2 concatenation of identifiers includes a wildcard identifier and further comprising:

3 mapping a second property path to a first value; and

4 determining a second value for the wildcard identifier in response to the first value
5 mapped to the second property path.

1 16. The method of claim 15 wherein the step of determining the second value further
2 comprises determining the second value such that replacing the wildcard identifier of the first
3 property path with the second value causes the current state mapped to the first property path
4 with the replaced wildcard identifier to be equal to the value mapped to the second property path.

1 17. The method of claim 1 further comprising dynamically binding the property path to one
2 of the application components including the property corresponding to the current state mapped
3 to that property path.

1 18. The method of claim 1 further comprising transmitting to the application a request to
2 update the current state of the property mapped to the property path associated with the element
3 of the user-interface in response to a user modification of the value.

Case 1:15-cv-01037-01

1 19. The method of claim 18 further comprising inhibiting a property change message in
2 response to the application updating the current state of the property in response to the request to
3 update.

1 20. The method of claim 1 wherein the user interface comprises an exemplary element
2 associated with a property path including a wildcard identifier, the wildcard identifier
3 corresponding to an indexed property including an index value range from a minimum value to a
4 maximum value, further comprising:

5 generating an additional element for each index value of the indexed property from the
6 minimum value to the maximum value by copying the given element associated with the property
7 path; and

8 associating a new property path with each additional element.

1 21. The method of claim 20 further comprising replacing the wildcard identifier associated
2 with the given element with the corresponding index value of the additional element to define the
3 new property path.

4 22. The method of claim 1 further comprising registering interest in the property path.

5 23. The method of claim 1 wherein the step of mapping further comprises mapping one of the
6 identifiers in the concatenation of the property path to a state of a property corresponding to the
7 one of the identifiers.

1 24. A system for associating an element of a user-interface to a current state of a property of
2 an application, the application having a plurality of components, at least one component having a
3 property, each property being identified with an identifier, the system comprising:

4 a property connector module to identify an association between the element of the user-
5 interface and a property path, the property path including a concatenation of a plurality of
6 identifiers, the concatenation of identifiers defining a path through the components of the
7 application to a property at the end of the concatenation, and to map the property path to a current
8 state of the property at the end of the path defined by the concatenation of identifiers, thereby
9 associating the element of the user-interface with the current state of that property.

1 25. The system of claim 24 wherein the property connector module is further configured to:

- 2 a) examine each identifier in the concatenation of the property path in succession;
- 3 b) determine, for the first identifier in the concatenation of the property path, a second
4 state of a property with a name identical to the first identifier, a component of the application
5 containing that property becoming a root application component;
- 6 c) identify, for the first identifier, a component of the application to which the second
7 state points as a current application component;
- 8 d) map the first identifier to the second state;
- 9 e) determine, for the next identifier in the concatenation of the property path, a next state
10 of a property with a name identical to the next identifier located within the current application
11 component;
- 12 f) identify, for the next identifier, a component of the application to which the next state
13 points as a current application component;
- 14 g) map the next identifier to the next state; and
- 15 h) repeat steps e, f and g until the last identifier of the concatenation is examined to map
16 the property path to the current state of the property with a name identical to the last identifier.

1 26. The system of claim 24 wherein the property connector module is further configured to
2 map the property path to the current state further comprises mapping the property path to an
3 undefined state if no property is found that corresponds to an identifier in the plurality of
4 identifiers in the concatenation.

1 27. The system of claim 24 wherein the property connector module is further configured to
2 generate a node tree having a plurality of nodes, wherein each node of the node tree represents a
3 mapping of an identifier to one of, a state of a property and an undefined state.

4 28. The system of claim 27 wherein the node tree represents a plurality of property paths.

5 29. The system of claim 24 wherein the property connector module is further configured to
6 monitor a plurality of states within the application to detect a change in one of the states of the
7 plurality of states, each state in the plurality corresponding to one of the states mapped to an
8 identifier in the concatenation of the property path.

9 30. The system of claim 29 wherein the property connector module is further configured to
2 receive a property change event from a JAVABEAN-compatible component.

1 31. The system of claim 29 wherein the property connector module is further configured to
2 re-map the property path to a new current state in response to detecting the change in one of the
3 states of the plurality of states.

1 32. The system of claim 29 wherein the property connector module is further configured to
2 re-map the identifier the concatenation of identifiers to the changed state in response to detecting
3 the change in one of the states of the plurality of states.

1 33. The system of claim 24 wherein the property connector module is further configured to
2 generate a property change message in response to a change in a state of a property corresponding
3 to one of the identifiers in the concatenation of the property path.

1 34. The system of claim 24 wherein the property connector module is further configured to
2 update one or more user-interface elements associated with the property path with a new current
3 state in response to a change in the current state of the property.

1 35. The system of claim 24 wherein the property connector module is further configured to:

2 a) detect a change in one of a plurality of states in an application, each state in the
3 plurality corresponding to one of the states mapped to an identifier in the concatenation of the
4 property path,

5 b) examine each identifier in the concatenation of the property path in succession,
6 starting with an identifier corresponding to the changed one of the states of the plurality of states;

7 c) determine for a currently examined identifier, a new next state of a property with a
8 name identical to the currently examined identifier;

9 d) re-map the currently examined identifier to the new next state in response to a change
10 in a currently mapped state; and

11 e) repeat steps c and d for each subsequent identifier in the concatenation of identifiers.

1 36. The system of claim 35 wherein the property connector module is further configured to
2 terminate the repeating in response to the new next state being identical to a state currently
3 mapped for that currently examined identifier.

1 37. The system of claim 35 wherein the property connector module is further configured to
2 monitor a new plurality of states within the application, the new plurality including the new next
3 states mapped to an identifier in the concatenation of the property path.

1 38. The system of claim 24 wherein the property path is a first property path and the
2 concatenation of identifiers includes a wildcard identifier and the property connector module is
3 further configured to:

4 map a second property path to a first value; and

5 determine a second value for the wildcard identifier in response to the first value mapped
6 to the second property path.

1 39. The system of claim 38 wherein the property connector module is further configured to
2 determine the second value such that replacing the wildcard identifier of the first property path
3 with the second value causes the current state mapped to the first property path with the replaced
4 wildcard identifier to be equal to the value mapped to the second property path.

1 40. The system of claim 24 wherein the property connector module is further configured to
2 dynamically bind the property path to one of the application components including the property
3 corresponding to the current state mapped to that property path.

1 41. The system of claim 24 wherein the property connector module is further configured to
2 transmit to the application a request to update the current state of the property mapped to the
3 property path associated with the element of the user-interface in response to a user modification
4 of the value.

1 42. The system of claim 41 wherein the property connector module is further configured to
2 inhibit a property change message in response to the application updating the current state of the
3 property in response to the request to update.

1 43. The system of claim 24 wherein the user interface comprises an exemplary element
2 associated with a property path including a wildcard identifier, the wildcard identifier
3 corresponding to an indexed property including an index value range from a minimum value to a
4 maximum value, and the property connector module is further configured to:

5 generate an additional element for each index value of the indexed property from the
6 minimum value to the maximum value by copying the given element associated with the property
7 path; and

8 associate a new property path with each additional element.

1 44. The system of claim 43 wherein the property connector module is further configured to
2 replace the wildcard identifier associated with the given element with the corresponding index
3 value of the additional element to define the new property path.

4 45. The system of claim 24 wherein the property connector module is further configured to
5 register interest in the property path.

6 46. The system of claim 24 wherein the property connector module is further configured to
7 map one of the identifiers in the concatenation of the property path to a state of a property
8 corresponding to the one of the identifiers.

1 47. The system of claim 24 further comprising:

2 a client node including:

3 the user interface having one or more elements; and

4 a client portion of the property connector module.

1 48. The system of claim 24 further comprising:

2 a server node including:

3 the application; and

4 a server portion of the property connector module.

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